Trend Study 16C-34-04

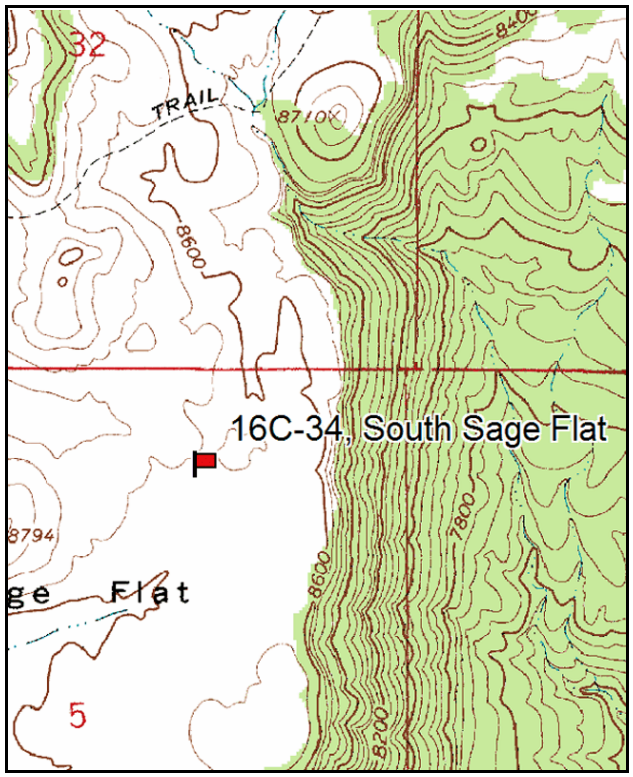
Study site name: South Sage Flat . Vegetation type: Black Sagebrush-Grass .

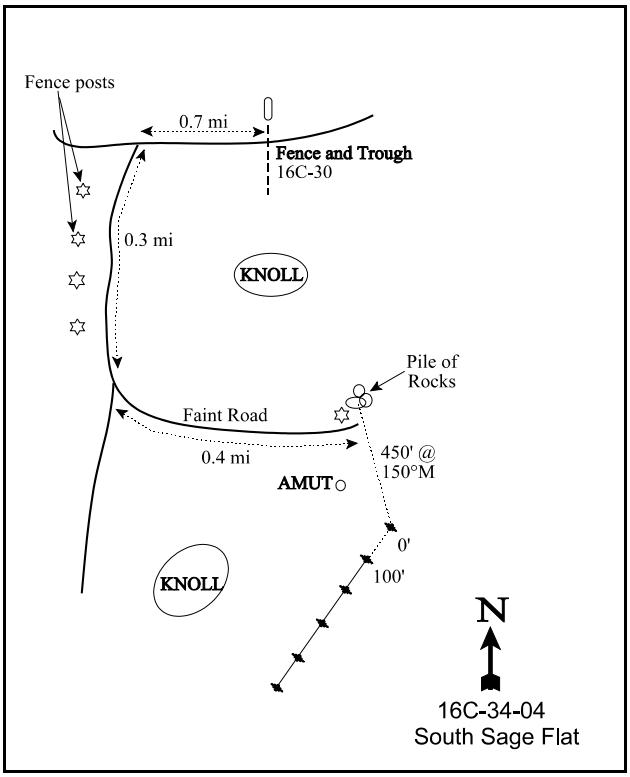
Compass bearing: frequency baseline 203 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From the fence and trough at site # 16C-30 (Upper Hole Trail), proceed west 0.7 miles. Turn left and travel along a road with fenceposts marking a water line for 0.3 miles. Turn left on a faint road and travel 0.4 miles to a fencepost and a pile of rocks on the left. From the rock pile, walk 450 ft at 150/ magnetic to the 0 ft baseline stake.





Map Name: Flagstaff Peak

Diagrammatic Sketch

Township 21S , Range 6E , Section 5

GPS: NAD 27, UTM 12S 4319441 N, 476883 E

DISCUSSION

South Sage Flat - Trend Study No. 16C-34

The South Sage Flat study was established in 1994 at South Sage Flat. It samples a black sagebrush-mountain big sagebrush/grass community south-west of Little Nelson Mountain on Forest Service land. Elevation at the site is 8,650 feet with a general east aspect and nearly level terrain. It was added to monitor the increasing elk population on the unit. Cattle use the area as part of the Ferron grazing allotment which is grazed from June 21 to October 5 by 1,607 cattle on an 8 pasture rest rotation system. There is a water trough about one-quarter of a mile to the north of the site. Pellet group data from 1999 estimate 1 deer, 85 elk and 31 cow days use/acre (3 ddu/ha, 210 edu/ha, 77 cdu/ha). Pellet group data from 2004 estimate 9 deer, 58 elk, and 14 cow days use/acre (22 ddu/ha, 144 edu/ha, and 34 cdu/ha). Cattle use was from the previous year and elk and deer use is from winter.

Soil on the site is moderately shallow with an effective rooting depth of just over 12 inches. There is a clay layer at 10 inches. Soil texture is a sandy clay loam with a neutral pH (6.9). Pavement sized rock is common on the surface and throughout the profile, with a few larger rocks scattered on the surface. Many of the rocks have a calcium carbonate coating. There is quite a bit of relative bare ground exposed (42% in 1994, 35% in 1999, and 34% in 2004) and light soil pedestaling evident. Erosion is minimal due mostly to the level terrain.

The key browse species on the site consists of a dense population of relatively small statured black sagebrush. Density has averaged about 14,000 plants/acre for 1994 and 1999, but decreased to only 6,440 in 2004. The large die off is most likely due to drought conditions for at most they were only lightly utilized. Seedlings were fairly abundant, but young recruitment is not enough to replace the portion that has died or is going to die. Utilization has been light and vigor is generally good. There is a small population of mountain big sagebrush on the site, indicating areas of deeper soil. Mountain big sagebrush density averaged 1,640 plants/acre in 1994 and 1999, but decreased to 240 plants/acre by 2004. No young recruitment was sampled in 2004, but could have been misidentified as black sagebrush seedlings or young. Utilization is moderate to heavy and vigor is poor. The only other abundant shrub on the site consists of a dense stand of low growing rabbitbrush. Palatability of this shrub is poor and most individuals are not utilized. Several other species of shrubs occurred on the site, although none were very abundant.

The herbaceous understory is fairly abundant and diverse with grasses and forbs accounting for almost 11% cover in 1994, 15% in 1999, and 18% in 2004. Sum of nested frequency for grasses and forbs indicates a well dispersed cover which is effective at holding the soil in place. The dominant grass is crested wheatgrass which was seeded in the past. The next most abundant grass is letterman needlegrass. Forbs are diverse and fairly abundant. The most common species include redroot eriogonum and pingue hymenoxys.

1994 APPARENT TREND ASSESSMENT

Protective ground cover is adequate to prevent serious erosion on the site. The apparent browse trend is stable with adequate numbers of seedlings and young, and low percent decadency for the preferred browse species, black sagebrush and Mountain big sagebrush. Utilization is generally light and vigor is good. The herbaceous understory is fairly abundant and diverse providing moderately effective protective ground cover for the soil. The Desirable Components Index (see methods) rated this site as fair with a score of 57 due to moderate shrub cover, low decadence, and moderate grass and forb cover.

winter range condition (DC Index) - 57 (fair) Mountain big sagebrush type

1999 TREND ASSESSMENT

Trend for soil is stable. Litter and vegetative cover have increased slightly, but percent cover for bare ground remains similar to 1994. There is some erosion occurring, although it is minimal due to the level terrain. The browse trend is stable for the key species, black sagebrush and mountain big sagebrush. Both show stable populations, mostly light to moderate use, good recruitment and vigor, and low decadence. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses increased slightly while frequency of perennial forbs declined slightly. Grasses provide the bulk of the herbaceous cover and crested wheatgrass accounts or 66% of the grass cover and 47% of the herbaceous cover. The Desirable Components Index rated this site as good with a score of 72 due to an increase in shrub cover, several young shrubs, and an increase in grass and forb cover.

TREND ASSESSMENT
soil - stable (3)
browse - stable(3)
herbaceous understory - stable (3)
winter range condition (DC Index) - 72 (good) Mountain big sagebrush type

2004 TREND ASSESSMENT

Trend for soil is stable. Litter, vegetation, and bare ground cover have remained similar to previous estimates. There are many open bare ground spots, but slope is flat so erosion is minimal. The browse trend is down for the key species, black sagebrush and mountain big sagebrush. Densities of both have decreased while the number of dead plants have increased. Black sagebrush is lightly used and has good vigor. Mountain big sagebrush is heavily hedged with poor vigor. Many of young plants in 1999 most likely did not become established to replace the dying population. Trend for herbaceous understory is slightly down. Sum of nested frequency for perennial grasses and forbs decreased, although cover actually increased. Grasses decreased mainly due to a loss of Letterman needlegrass, while for forbs the decrease was in mat penstemon. Grasses provide the bulk of the herbaceous cover and crested wheatgrass accounted for 87% of the grass cover and 76% of the herbaceous cover. The Desirable Components Index rated this site as fair with a score of 50 due to a decrease in shrub cover, high decadence, and excellent grass cover.

TREND ASSESSMENT
soil - stable (3)
browse - down (1)
herbaceous understory - slightly down (2)
winter range condition (DC Index) - 50 (fair) Mountain big sagebrush type

HERBACEOUS TRENDS --
Management unit 16C, Study no: 34

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	233	254	234	4.23	6.86	13.96
G	Agropyron dasystachyum	a-	a-	b22	-	-	.40
G	Agropyron smithii	a1	a6	b20	.00	.15	.19
G	Bromus inermis	8	3	-	.01	.06	-

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	Elymus salina	ab15	b41	a6	.11	.21	.06
G	Oryzopsis hymenoides	-	-	1	-	-	.03
G	Poa fendleriana	64	40	63	1.03	.50	.75
G	Sitanion hystrix	2	2	9	.03	.06	.10
G	Stipa lettermani	b133	b120	a51	1.95	2.49	.45
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		456	466	406	7.38	10.36	15.96
Total for Grasses		456	466	406	7.38	10.36	15.96
F	Androsace septentrionalis (a)	a-	b28	a-	-	.14	-
F	Arabis spp.	3	3	2	.00	.01	.01
F	Astragalus convallarius	6	-	1	.03	-	.03
F	Astragalus miser	3	3	2	.15	.03	.00
F	Aster spp.	a-	b14	a-	-	.05	-
F	Castilleja linariaefolia	3	2	-	.01	.01	-
F	Calochortus nuttallii	-	-	7	-	-	.02
F	Chaenactis douglasii	-	4	-	-	.00	-
F	Chenopodium leptophyllum(a)	a-	a-	b50	-	-	.23
F	Cryptantha spp.	2	-	-	.00	-	-
F	Eriogonum alatum	3	-	-	.03	-	-
F	Erigeron eatonii	c128	b49	a3	1.05	.36	.03
F	Erigeron flagellaris	-	-	3	-	-	.03
F	Erigeron pumilus	b15	a2	a4	.04	.03	.01
F	Eriogonum racemosum	a25	b65	b52	.16	.56	.43
F	Gayophytum ramosissimum(a)	-	-	2	-	-	.01
F	Hymenoxys acaulis	b16	a4	a3	.10	.01	.00
F	Hymenoxys richardsonii	51	55	32	.78	1.23	.67
F	Ipomopsis aggregata	-	2	-	-	.03	-
F	Linum lewisii	2	1	-	.03	.03	.03
F	Lupinus argenteus	b10	ab3	a-	.07	.09	-
F	Machaeranthera canescens	3	3	6	.01	.01	.02
F	Machaeranthera grindelioides	12	10	6	.08	.10	.09
F	Penstemon caespitosus	b71	b55	a-	.35	1.17	-
F	Penstemon spp.	5	-	3	.01	-	.03
F	Petradoria pumila	5	2	2	.03	.03	.03
F	Phlox longifolia	-	-	2	-	-	.00
F	Polygonum douglasii (a)	-	-	7	-	-	.01
F	Potentilla gracilis	ab3	b9	a-	.03	.07	.00

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
F	Senecio multilobatus	$_{a}$4	$_{ab}$22	$_{b}$29	.00	.07	.20
F	Sphaeralcea coccinea	3	7	9	.01	.07	.21
F	Trifolium spp.	36	43	62	.16	.09	.21
Total for Annual Forbs		0	28	59	0	0.14	0.26
Total for Perennial Forbs		409	358	228	3.20	4.08	2.09
Total for Forbs		409	386	287	3.20	4.23	2.35

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 16C, Study no: 34

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia nova	98	100	91	9.90	11.98	6.00
B	Artemisia tridentata vaseyana	29	37	7	3.06	3.95	.38
B	Chrysothamnus depressus	0	4	3	-	.15	.03
B	Chrysothamnus viscidiflorus viscidiflorus	92	93	87	3.55	7.03	8.10
B	Eriogonum corymbosum	13	13	12	.36	.34	.33
B	Gutierrezia sarothrae	14	14	24	.03	.09	.48
B	Leptodactylon pungens	1	2	1	-	-	-
B	Opuntia spp.	1	1	1	-	-	-
B	Pediocactus simpsonii	0	0	1	-	-	-
B	Symphoricarpos oreophilus	1	1	1	-	-	-
Total for Browse		249	265	228	16.92	23.55	15.34

CANOPY COVER, LINE INTERCEPT --
Management unit 16C, Study no: 34

Species	Percent Cover '04
Artemisia nova	6.56
Artemisia tridentata vaseyana	.21
Chrysothamnus viscidiflorus viscidiflorus	10.56
Eriogonum corymbosum	.81
Gutierrezia sarothrae	.33

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 16C, Study no: 34

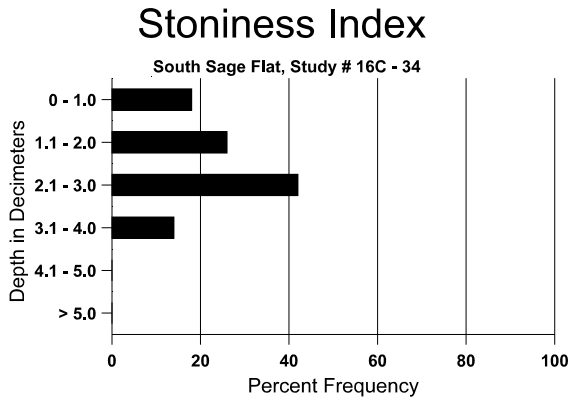
Species	Average leader growth (in) '04
Artemisia nova	1.2

BASIC COVER --
Management unit 16C, Study no: 34

Cover Type	Average Cover % '94	'99	'04
Vegetation	29.04	33.97	34.65
Rock	4.80	1.56	1.79
Pavement	1.41	8.42	8.31
Litter	20.91	27.77	28.44
Cryptogams	0	.04	.03
Bare Ground	40.17	38.25	38.18

SOIL ANALYSIS DATA --
Management unit 16C, Study no: 34, Study Name: South Sage Flat

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
12.2	54.0 (11.2)	6.9	62.0	15.4	22.6	1.9	10.5	115.2	0.6



PELLET GROUP DATA --
Management unit 16C, Study no: 34

Type	Quadrat Frequency '94	'99	'04
Rabbit	10	15	3
Elk	48	59	42
Deer	12	8	3
Cattle	4	8	4

Days use per acre (ha) '99	'04
-	-
85 (210)	58 (144)
1 (2)	9 (22)
31 (77)	14 (34)

BROWSE CHARACTERISTICS --
Management unit 16C, Study no: 34

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
94	**0**	-	-	-	-	-	0	0	-	-	0	11/11
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	-	-	-	-	-	0	0	-	-	0	-/-
Artemisia nova												
94	**13900**	200	1380	10320	2200	440	17	5	16	2	2	6/16
99	**14120**	700	2700	8560	2860	520	16	4	20	5	5	6/15
04	**6440**	1200	400	4560	1480	3160	0	0	23	16	16	6/11
Artemisia tridentata vaseyana												
94	**1600**	-	180	1340	80	20	30	0	5	3	3	14/30
99	**1680**	140	360	1180	140	20	13	20	8	1	1	14/27
04	**240**	-	-	120	120	360	50	42	50	50	50	13/23
Chrysothamnus depressus												
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**100**	-	40	60	-	-	0	0	-	-	0	2/5
04	**60**	-	-	60	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
94	**9560**	20	440	9020	100	-	.20	0	1	-	0	4/8
99	**12480**	220	1320	10980	180	-	1	0	1	-	0	3/8
04	**7460**	2220	200	7260	-	40	0	0	0	-	0	5/10
Eriogonum corymbosum												
94	**320**	-	-	280	40	-	6	0	13	6	6	9/19
99	**340**	-	40	300	-	-	24	6	0	-	0	12/21
04	**280**	40	-	240	40	20	7	7	14	7	7	9/20
Eriogonum microthecum												
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	-	-	-	-	-	0	0	-	-	0	9/17
Gutierrezia sarothrae												
94	**640**	-	40	560	40	60	0	0	6	6	6	5/7
99	**540**	-	100	440	-	-	0	0	0	-	0	5/6
04	**1220**	60	-	1220	-	-	0	0	0	-	0	7/7

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Leptodactylon pungens												
94	**20**	-	-	20	-	-	0	0	0	-	0	-/-
99	**60**	-	-	40	20	-	0	0	33	33	33	2/6
04	**20**	-	-	20	-	-	0	0	0	-	0	5/6
Opuntia spp.												
94	**40**	-	-	40	-	-	0	0	0	-	0	2/5
99	**40**	-	-	20	20	-	0	0	50	-	0	-/-
04	**20**	-	-	20	-	-	0	0	0	-	0	3/9
Pediocactus simpsonii												
94	**0**	-	-	-	-	-	0	0	-	-	0	-/-
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**20**	-	-	20	-	-	0	0	-	-	0	-/-
Symphoricarpos oreophilus												
94	**20**	-	-	20	-	-	0	0	-	-	0	14/38
99	**20**	-	-	20	-	-	0	0	-	-	0	13/27
04	**40**	-	-	40	-	-	0	0	-	-	0	9/22
Tetradymia canescens												
94	**0**	-	-	-	-	-	0	0	-	-	0	4/8
99	**0**	-	-	-	-	-	0	0	-	-	0	-/-
04	**0**	-	-	-	-	-	0	0	-	-	0	4/9